The U.S. Department of Energy's (DOE) Federal Energy Management Program (FEMP) facilitates the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship.

PURCHASING SPECIFICATIONS FOR ENERGY-EFFICIENT PRODUCTS

Residential Dishwashers

Legal Authorities

Federal agencies are required by the National Energy Conservation Policy Act (P.L. 95-619), Executive Order 13423, and Federal Acquisition Regulations (FAR) Subpart 23.2 and 53.223 to specify and buy ENERGY STAR®-qualified products or, in categories not included in the ENERGY STAR program, FEMP-designated products. FEMP-designated products are among the highest 25 percent of equivalent products for energy efficiency.

Performance Requirement for Federal Purchases		
Dishwasher Type	Annual Energy Use[a]	Water Use
Standard[b]	324 kWh or less	5.8 gallons per cycle or less
Compact[c]	234 kWh or less	4.0 gallons per cycle or less

a) Based on the DOE test procedure defined in 10 CFR 40, Subpart B, Appendix C.
b) Includes both built-in and portable dishwashers with a capacity of eight or more place settings and six or more serving pieces.
c) Includes built-in and counter top dishwashers with a capacity less than eight place settings and six serving pieces.

Buying Energy-Efficient Residential Dishwashers

This *Specification* applies to compact and standard capacity residential dishwashers only. Commercial and flight type products are excluded. When purchasing residential dishwashers, specify or select models that are ENERGY STAR-qualified, all of which meet the *Performance Requirements* shown above. A list of qualified products is available on the ENERGY STAR Web site. The Federal supply sources for residential dishwashers are the General Services Administration (GSA) and the Defense Logistics Agency (DLA). GSA sells residential dishwashers through its Multiple Awards Schedule program and online shopping network, *GSA Advantage!* DLA offers them through the Defense Supply Center Philadelphia and online through DLA E-Mall.

These requirements apply to all forms of procurements, including: guide and project specifications; construction, renovation, repair, energy service, operation and maintenance (O&M) contracts; lease agreements and solicitations for offers. Energy performance requirements should be included in all evaluations of solicitation responses. Buyers shall insert the standard clause from FAR section 52.223-15 into contracts and solicitations that deliver, acquire, furnish, or specify energy consuming products for use in Federal facilities. Agencies can claim an exception to these requirements through a written finding that no ENERGY STAR-qualified or FEMP-designated product is life cycle cost-effective for a specific application.

Buyer Tips

Appliance manufacturers are required by law to attach the Federal Trade Commission's (FTC) yellow EnergyGuide label to residential dishwashers. The information on this label can be used to verify that dishwashers meet the *Annual Energy Use* requirement of this *Specification*. Visit the FTC Web site to learn more about this labeling program.

In housing units designed for one or two occupants, consider installing compact dishwashers. Since these products are designed to hold fewer place settings and service pieces than standard capacity dishwashers, they will fill more quickly and the occupants will more likely use them instead of hand washing. In addition, compact dishwashers are about six inches narrower than standard models and require less floor space, which is desirable in smaller housing units.

Many Federal office buildings have kitchen areas equipped with dishwashers. The *Performance Requirements* from this *Specification* apply when residential dishwashers are used in these situations.

User Tips

Dishwashers require the hottest water of all household uses, typically 135 to 140ºF. However, these products are usually equipped with booster heaters to raise incoming water temperature by 15 to 20ºF. Setting the water heater between 120 and 125ºF and turning the dishwasher's booster

For More Information:

Federal Energy Management Program
(202) 586-5772
www.femp.energy.gov/procurement/

Lawrence Berkeley Laboratory provided product research and life cycle cost analysis in support of this specification.
(202) 488-2250

EPA/DOE ENERGY STAR
(888) 782-7937
www.energystar.gov/

Federal Trade Commission is a government agency dedicated to consumer protection. Energy use information for dishwashers is available on EnergyGuide labels attached to these products and the FTC's Web site at
www.ftc.gov/energy/

National Institute of Standards and Technology publishes *Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis—2009 Annual Supplement to NIST Handbook 135 and NBS Special Publication 709* (NISTIR 85-3273-24, Rev. 5/09). This document is available online at:
www.femp.energy.gov/pdfs/ashb09.pdf

Federal Supply Sources:

General Services Administration
(816) 926-6760
www.gsa.gov/
www.gsaadvantage.gov/

Defense Logistics Agency
(Access to DLA's Web sites requires enhanced security measures. Civilian Federal agencies may have difficulty accessing these sites.)
www.dla.mil/
dod-emall.dla.mil

Defense Supply Center Philadelphia
(800) DLA-BULB
www.dscp.dla.mil/

Version 6: June 2010

on will provide sufficiently hot water while saving energy and also reducing the chances for scalding. Set dishwashers to "Air Dry" to save additional energy during the drying cycle.

Studies have shown that using fully-loaded dishwashers results in less energy and water consumption than washing the same amount of dishes by hand. The cleaning performance of products manufactured within the past 10 years has improved dramatically, even when washing heavily soiled dishes. Because of this, rinsing dishes prior to cleaning them in a dishwasher is unnecessary and wastes both water and energy. Encourage users, such as those living in military family housing units, to operate dishwashers only when full and to scrape food waste off of dishes instead of rinsing it off.

Cost-Effectiveness Example

Performance	Base Model	Required	Best Available[a]
Annual Energy Use	355 kWh	324 kWh	180 kWh
Water Use per Cycle (maximum)	6.5 gallons	5.8 gallons	1.57 gallons
Annual Water Use	1,400 gallons	1,250 gallons	338 gallons
Annual Energy and Water Cost	$35	$32	$16
Lifetime Energy and Water Cost	$350	$320	$160
Lifetime Cost Savings	**—**	**$30**	**$190**

Cost-Effectiveness Assumptions

In the example above, *Annual Energy Use* was calculated using the DOE appliance test procedure for a standard capacity dishwasher operated 215 cycles per year. The efficiency of the *Base Model* is the minimum allowed by DOE appliance standards, the efficiency of the *Required* model meets this *Specification*, and the efficiency of the *Best Available* model is from the ENERGY STAR list of qualified products. The assumed price for electricity is $0.08 per kWh and the combined rate for water and sewer is $4.50 per 1,000 gallons, the average at Federal facilities in the U.S. *Lifetime Utility Cost* is the sum of the discounted value of the *Annual Utility Cost* based on average usage and an assumed dishwasher life of 13 years. Future utility price trends and a discount rate of 3.0 percent are from National Institute of Standards and Technology (NIST) guidelines.

Using the Cost-Effectiveness Table

The *Required* model is cost-effective if its purchase price is no more than $30 above the *Base Model*. The *Best Available* dishwasher is cost-effective if its purchase price is no more than $190 above the *Base Model*. Savings will be slightly less in situations where hot water is provided by natural gas water heaters.

What if My Utility Rates are Different?

ENERGY STAR has an Excel-based cost calculator for dishwashers online at *www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers*. Click on "Savings Calculator – Dishwashers," select the water heater type, and input the utility rates at your facility. The cost calculator will automatically display results that more accurately reflect your conditions.

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

For additional information please contact:
EERE Information Center
1-877-EERE-INF (1-877-337-3463)
www.eere.energy.gov/informationcenter

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Prepared by Lawrence Berkeley National Laboratory (LBNL) and produced by the National Renewable Energy Laboratory (NREL), both national laboratories of the U.S. Department of Energy. NREL is operated by the Alliance for Sustainable Energy, LLC.

DOE/GO-102010-3084 • June 2010

FEMP Federal Energy Management Program